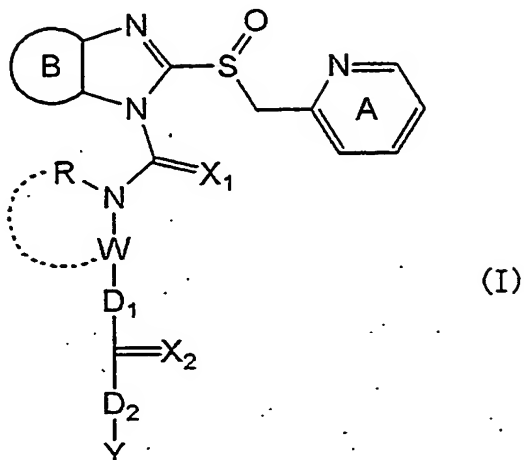


## CLAIMS

1. An imidazole compound represented by the formula (I):



5 wherein

ring A is a pyridine ring optionally having substituents,

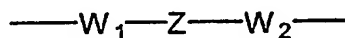
ring B is a benzene ring optionally having substituents or a monocyclic aromatic heterocycle optionally having substituents,

10  $X_1$  and  $X_2$

are each an oxygen atom or a sulfur atom,

W is a divalent chain hydrocarbon group optionally having substituents or a divalent group represented by the formula:

15



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wherein  $W_1$  and  $W_2$  are each a divalent chain hydrocarbon group or a bond, Z is a divalent hydrocarbon ring group optionally having substituents, a divalent heterocyclic group optionally having substituents, an oxygen atom,  $SO_n$  wherein n is 0, 1 or 2, or  $>N-E$  wherein E is a hydrogen atom, a hydrocarbon group optionally having substituents, a heterocyclic group optionally having

25

substituents, a lower alkanoyl group, a lower  
alkoxycarbonyl group, an aralkyloxycarbonyl group, a  
thiocarbamoyl group, a lower alkylsulfinyl group, a  
lower alkylsulfonyl group, a sulfamoyl group, a  
5 mono-lower alkylsulfamoyl group, a di-lower  
alkylsulfamoyl group, an arylsulfamoyl group, an  
arylsulfinyl group, an arylsulfonyl group, an  
arylcarbonyl group or a carbamoyl group optionally  
having substituents, and when Z is an oxygen atom,  
10  $\text{SO}_n$  or  $>\text{N}-\text{E}$ ,  $\text{W}_1$  and  $\text{W}_2$  are each a divalent chain  
hydrocarbon group,

R is a hydrocarbon group optionally having substituents or  
a heterocyclic group optionally having substituents,

R and W

15 may be bonded to each other,

$\text{D}_1$  and  $\text{D}_2$

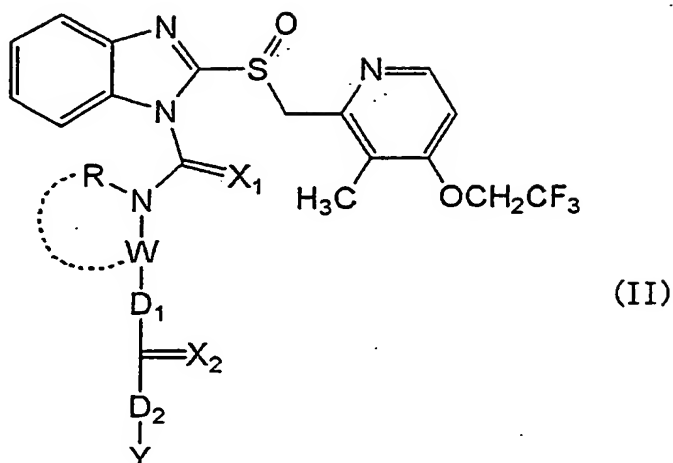
are each a bond, an oxygen atom, a sulfur atom or  $>\text{NR}_1$   
wherein  $\text{R}_1$  is a hydrogen atom or a hydrocarbon group  
optionally having substituents, except for when  $\text{D}_1$  and  $\text{D}_2$   
20 are each a bond, and

Y is a hydrocarbon group optionally having substituents or  
a heterocyclic group optionally having substituents,  
or a salt thereof.

25 2. The compound of claim 1, wherein Z is a divalent  
hydrocarbon ring group optionally having substituents or a  
divalent heterocyclic group optionally having substituents.

3. The compound of claim 1, wherein ring B is a benzene ring  
30 optionally having substituents.

4. The compound of claim 1, which is represented by the  
formula (II):



wherein each symbol in the formula is as defined in claim 1.

5 5. The compound of any of claims 1 to 4, wherein  $X_1$  and  $X_2$  are each an oxygen atom.

6. The compound of claim 1, wherein  $D_1$  and  $D_2$  are each a bond or an oxygen atom, except for when  $D_1$  and  $D_2$  are each a bond.

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7. The compound of claim 1, wherein W is a divalent chain hydrocarbon group optionally having substituents.

8. The compound of claim 1, wherein W is an ethylene group.

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9. The compound of claim 1, wherein R is a  $C_{1-6}$  hydrocarbon group optionally having substituents.

10. The compound of claim 1, wherein Y is a  $C_{1-6}$  hydrocarbon  
20 group optionally having substituents or a saturated heterocyclic group optionally having substituents, which contains, as ring-constituting atom, 1 to 4 heteroatom(s) selected from oxygen atom, nitrogen atom and sulfur atom.

25 11. The compound of claim 1, wherein  $X_1$  and  $X_2$  are each an

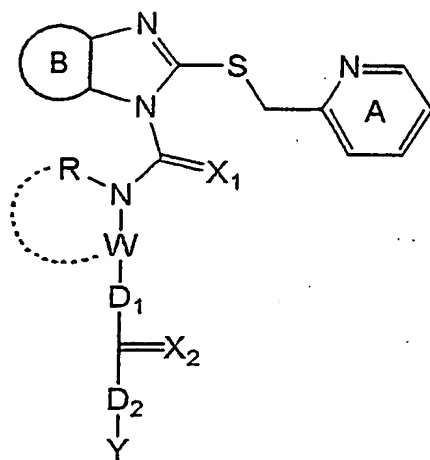
oxygen atom, D<sub>1</sub> and D<sub>2</sub> are each a bond or an oxygen atom except for when D<sub>1</sub> and D<sub>2</sub> are both a bond, W is an ethylene group, R is a C<sub>1-6</sub> alkyl group, and Y is a C<sub>1-6</sub> hydrocarbon group optionally having substituents or a saturated oxygen-containing heterocyclic group optionally having substituents, which may further contain, as ring-constituting atom, 1 to 3 heteroatom(s) selected from oxygen atom, nitrogen atom and sulfur atom.

12. The compound of claim 1, which is a compound selected from
- 2-[methyl[[ (R)-2-[[[3-methyl-4-(2,2,2-trifluoroethoxy)-2-pyridyl]methyl]sulfinyl]-1H-benzimidazol-1-yl]carbonyl]amino]ethyl acetate,
- ethyl 2-[methyl[[ (R)-2-[[[3-methyl-4-(2,2,2-trifluoroethoxy)-2-pyridyl]methyl]sulfinyl]-1H-benzimidazol-1-yl]carbonyl]amino]ethyl carbonate,
- 2-[methyl[[ (R)-2-[[[3-methyl-4-(2,2,2-trifluoroethoxy)-2-pyridyl]methyl]sulfinyl]-1H-benzimidazol-1-yl]carbonyl]amino]ethyl tetrahydropyran-4-yl carbonate,
- 2-[methyl[[2-[[[3-methyl-4-(2,2,2-trifluoroethoxy)-2-pyridyl]methyl]sulfinyl]-1H-benzimidazol-1-yl]carbonyl]amino]ethyl tetrahydropyran-4-yl carbonate,
- ethyl 2-[methyl[[2-[[[3-methyl-4-(2,2,2-trifluoroethoxy)-2-pyridyl]methyl]sulfinyl]-1H-benzimidazol-1-yl]carbonyl]amino]ethyl carbonate,
- ethyl 2-[[[5-methoxy-2-[[ (4-methoxy-3,5-dimethyl-2-pyridyl)methyl]sulfinyl]-3H-imidazo[4,5-b]pyridin-3-yl]carbonyl] (methyl)amino]ethyl carbonate,
- 2-[[[5-methoxy-2-[[ (4-methoxy-3,5-dimethyl-2-pyridyl)methyl]sulfinyl]-3H-imidazo[4,5-b]pyridin-3-yl]carbonyl] (methyl)amino]ethyl acetate,
- 2-[methyl[[2-[[[3-methyl-4-(2,2,2-trifluoroethoxy)-2-pyridyl]methyl]sulfinyl]-1H-benzimidazol-1-

yl]carbonyl]amino]ethyl acetate,  
 ethyl 2-[[[5-methoxy-2-[[[4-methoxy-3,5-dimethyl-2-  
 pyridyl)methyl]sulfinyl]-1H-benzimidazol-1-  
 yl]carbonyl](methyl)amino]ethyl carbonate,  
 5 ethyl 2-[[[(S)-5-methoxy-2-[[[4-methoxy-3,5-dimethyl-2-  
 pyridyl)methyl]sulfinyl]-1H-benzimidazol-1-  
 yl]carbonyl](methyl)amino]ethyl carbonate,  
 ethyl 2-[[[2-[[[4-(3-methoxypropoxy)-3-methyl-2-  
 pyridyl)methyl]sulfinyl]-1H-benzimidazol-1-  
 10 yl]carbonyl](methyl)amino]ethyl carbonate, and  
 2-[[[5-(difluoromethoxy)-2-[[[3,4-dimethoxy-2-  
 pyridyl)methyl]sulfinyl]-1H-benzimidazol-1-  
 yl]carbonyl](methyl)amino]ethyl ethyl carbonate,  
 or a salt thereof.

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13. A compound represented by the formula (V):



(V)

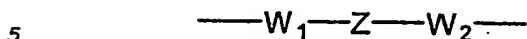
wherein

20 ring A is a pyridine ring optionally having substituents,  
 ring B is a benzene ring optionally having substituents or a  
 monocyclic aromatic heterocycle optionally having  
 substituents,

X<sub>1</sub> and X<sub>2</sub>

25 are each an oxygen atom or a sulfur atom,

W is a divalent chain hydrocarbon group optionally having substituents or a divalent group represented by the formula:



wherein  $W_1$  and  $W_2$  are each a divalent chain hydrocarbon group or a bond, Z is a divalent hydrocarbon ring group optionally having substituents, a divalent heterocyclic group optionally having substituents, an oxygen atom,  $SO_n$  wherein n is 0, 1 or 2, or  $>N-E$  wherein E is a hydrogen atom, a hydrocarbon group optionally having substituents, a heterocyclic group optionally having substituents, a lower alkanoyl group, a lower alkoxy carbonyl group, an aralkyloxy carbonyl group, a thiocarbamoyl group, a lower alkylsulfinyl group, a lower alkylsulfonyl group, a sulfamoyl group, a mono-lower alkylsulfamoyl group, a di-lower alkylsulfamoyl group, an arylsulfamoyl group, an arylsulfinyl group, an arylsulfonyl group, an arylcarbonyl group or a carbamoyl group optionally having substituents, and when Z is an oxygen atom,  $SO_n$  or  $>N-E$ ,  $W_1$  and  $W_2$  are each a divalent chain hydrocarbon group,

R is a hydrocarbon group optionally having substituents or a heterocyclic group optionally having substituents,

R and W

may be bonded to each other,

$D_1$  and  $D_2$

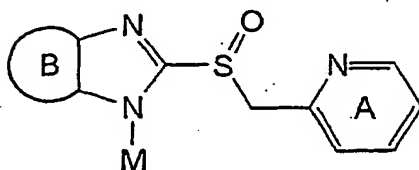
are each a bond, an oxygen atom, a sulfur atom or  $>NR_1$  wherein  $R_1$  is a hydrogen atom or a hydrocarbon group optionally having substituents, except for when  $D_1$  and  $D_2$

are each a bond, and  
 Y is a hydrocarbon group optionally having substituents or  
 a heterocyclic group optionally having substituents, or  
 a salt thereof.

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14. A production method of a compound of claim 1, which  
 comprises

(1) condensing a compound represented by the formula (III):



(III)

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wherein

ring A is a pyridine ring optionally having substituents,

ring B is a benzene ring optionally having substituents or a  
 monocyclic aromatic heterocycle optionally having

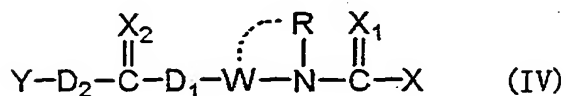
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substituents, and

M is a hydrogen atom, a metal cation or a quaternary  
 ammonium ion,

or a salt thereof, with a compound represented by the formula  
 (IV):

20



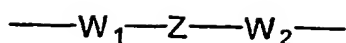
wherein

X is a leaving group,

25 X<sub>1</sub> and X<sub>2</sub>

are each an oxygen atom or a sulfur atom,

W is a divalent chain hydrocarbon group optionally having  
 substituents, or a divalent group of the formula:

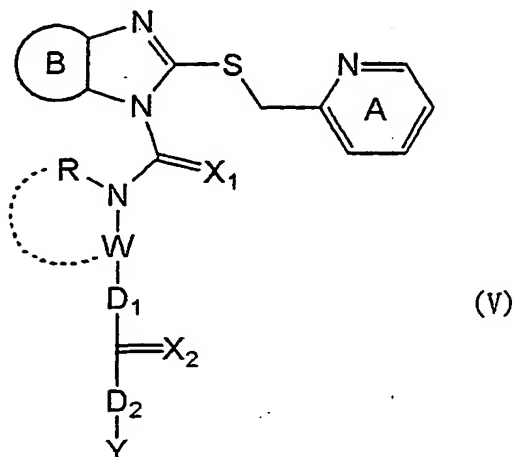


wherein  $W_1$  and  $W_2$  are each a divalent chain  
 hydrocarbon group or a bond,  $Z$  is a divalent  
 hydrocarbon ring group optionally having  
 substituents, a divalent heterocyclic group  
 optionally having substituents, an oxygen atom,  $SO_n$   
 wherein  $n$  is 0, 1 or 2, or  $>N-E$  wherein  $E$  is a  
 hydrogen atom, a hydrocarbon group optionally having  
 substituents, a heterocyclic group optionally having  
 substituents, a lower alkanoyl group, a lower  
 alkoxy carbonyl group, an aralkyloxy carbonyl group, a  
 thiocarbamoyl group, a lower alkylsulfinyl group, a  
 lower alkylsulfonyl group, a sulfamoyl group, a  
 mono-lower alkylsulfamoyl group, a di-lower  
 alkylsulfamoyl group, an arylsulfamoyl group, an  
 arylsulfinyl group, an arylsulfonyl group, an  
 arylcarbonyl group or a carbamoyl group optionally  
 having substituents, and when  $Z$  is an oxygen atom,  
 $SO_n$  or  $>N-E$ ,  $W_1$  and  $W_2$  are each a divalent chain  
 hydrocarbon group,  
 $R$  is a hydrocarbon group optionally having substituents or  
 a heterocyclic group optionally having substituents,  
 $R$  and  $W$   
 may be bonded to each other,  
 $D_1$  and  $D_2$   
 are each a bond, an oxygen atom, a sulfur atom, or  $>NR_1$   
 wherein  $R_1$  is a hydrogen atom or a hydrocarbon group  
 optionally having substituents, except for when  $D_1$  and  $D_2$   
 are each a bond, and  
 $Y$  is a hydrocarbon group optionally having substituents or  
 a heterocyclic group optionally having substituents, or



a salt thereof, or

(2) subjecting a compound represented by the formula (V):



5 wherein each symbol in the formula is as defined above, or a salt thereof, to an oxidization reaction.

15. A pharmaceutical composition comprising a compound of claim 1.

10

16. The pharmaceutical composition of claim 15, which is an agent for the prophylaxis or treatment of peptic ulcer, gastritis, peptic esophagitis, symptomatic gastroesophageal reflux disease (symptomatic GERD) free of esophagitis, NUD,  
 15 gastric cancer, gastric MALT lymphoma, Zollinger-Ellison syndrome, acid indigestion or upper gastrointestinal hemorrhage.

17. A commercial package comprising a pharmaceutical  
 20 composition of claim 16 and written matter associated therewith, the written matter stating that the pharmaceutical composition can or should be used for the prophylaxis or treatment of peptic ulcer, gastritis, peptic esophagitis, symptomatic gastroesophageal reflux disease (symptomatic GERD)  
 25 free of esophagitis, NUD, gastric cancer, gastric MALT

lymphoma, Zollinger-Ellison syndrome, acid indigestion or upper gastrointestinal hemorrhage.

18. The pharmaceutical composition of claim 15, which is an agent for the eradication of *Helicobacter pylori*.

19. A commercial package comprising a pharmaceutical composition of claim 18 and written matter associated therewith, the written matter stating that the pharmaceutical composition can or should be used for the eradication of *Helicobacter pylori*.

20. A method for the prophylaxis or treatment of peptic ulcer, gastritis, peptic esophagitis, symptomatic gastroesophageal reflux disease (symptomatic GERD) free of esophagitis, NUD, gastric cancer, gastric MALT lymphoma, Zollinger-Ellison syndrome, acid indigestion or upper gastrointestinal hemorrhage in an animal, which comprises administering an effective amount of a compound of claim 1 to the animal.

21. A method for eradicating *Helicobacter pylori* from an animal infected with *Helicobacter pylori*, which comprises administering an effective amount of a compound of claim 1 to the animal.

22. Use of a compound of claim 1 for the production of a prophylactic or therapeutic agent of peptic ulcer, gastritis, peptic esophagitis, symptomatic gastroesophageal reflux disease (symptomatic GERD) free of esophagitis, NUD, gastric cancer, gastric MALT lymphoma, Zollinger-Ellison syndrome, acid indigestion or upper gastrointestinal hemorrhage.

23. Use of a compound of claim 1 for the production of an

agent for eradicating *Helicobacter pylori*.

24. The pharmaceutical composition of claim 15, further comprising at least one antibacterial agent in combination  
s with the compound of claim 1, wherein active components are formulated altogether in a fixed formulation, or formulated independently for concurrent administration or administration at staggered times to a single subject.